WHAT IS CLAIMED IS:

1. A process for melt spinning a composition comprising a highly fluorinated thermoplastic polymer, comprising the steps of:

melting a composition comprising a highly fluorinated thermoplastic polymer to form a molten fluoropolymer composition;

conveying said molten fluoropolymer composition under pressure to an extrusion die of an apparatus for melt spinning; and

extruding the molten fluoropolymer composition through the extrusion die to form filaments, said die being at a temperature of at least about 450°C, at a shear rate of at least about 100 sec^{-1}, at a spinning speed of at least about 500 m/min.

2. The process of claim 1 further comprising shielding the filaments as they exit said die.

3. The process of claim 1 further comprising exposing the molten fluoropolymer composition to an intermediate temperature ranging between the melting temperature of said composition and a temperature less than the temperature of the extrusion die prior to extruding said composition through the extrusion die.

4. The process of claim 1 wherein the extrusion die is thermally isolated from other areas of the apparatus that may contain the fluoropolymer composition.

5. A process for melt spinning a composition comprising polytetrafluoroethylene homopolymer, comprising the steps of: melting a composition comprising polytetrafluoroethylene homopolymer to form a molten polytetrafluoroethylene composition; conveying said molten polytetrafluoroethylene composition under pressure to an extrusion die of an apparatus for melt spinning; and extruding the molten polytetrafluoroethylene composition through the extrusion die to form molten filaments.

6. The process of claim 5 wherein the temperature of the extrusion die is at least 450°C.

7. An apparatus for melt-spinning fibers, comprising:

a spinneret assembly comprising:

means for filtering;

a spinneret;

an elongated transfer line, said transfer line being disposed between said filtration means and said spinneret;

means for heating said elongated transfer line;

means for heating said spinneret; and

an elongated annealer disposed beneath said spinneret assembly.

8. The apparatus of claim 7 wherein the elongated annealer comprises an inner tube disposed within an outer tube, said inner tube and said outer tube separated from each other by an annular space.

9. The apparatus of claim 8 further comprising a mesh tube disposed adjacent the inner wall of said inner tube extending at least partially down the length of said inner tube.

10. The apparatus of claim 8 further comprising at least one perforated plate disposed within said annular space, extending radially with respect to the circumference of said outer tube, and attached to the outer wall of said inner tube or the inner wall of said outer tube, or to both tubes.

11. The apparatus of claim 10 further comprising a screen placed on or in close proximity to the at least one perforated plate.

12. The apparatus of claim 7 wherein the elongated annealer further comprises means for measuring or controlling air flow rate.

13. Process for making filament yarn of highly fluorinated thermoplastic polymer comprising melt spinning said polymer into said filament at a temperature above the melting point of said polymer which is effective upon drawing of said filament to produce said filament wherein the orientation of the filament at the surface of the filament is no greater than in the core of the filament.

14. The process of claim 13 wherein the orientation of said filament is greater in the core of said filament than at the surface thereof.

15. The process of claims 13 wherein said melt spinning and drawing is of multifilament yarn of said polymer.

16. The process of claims 13 wherein said melt spinning is carried out at a temperature of at least about 90°C greater than the melting point of said polymer.

17. The process of claim 13 wherein said filament is produced at a speed of at least about 500 m/min.

18. Process comprising melt spinning highly fluorinated thermoplastic polymer into at least one molten filament and shielding the resultant molten filament from turbulent air to delay the solidification of the filament until it reaches a distance of at least about 50X the diameter of the die through which the filament is melt spun.

19. The process off claim 18 wherein said shielding includes cooling said molten filament with air to obtain said solidification, said shielding preventing said air from being turbulent.

20. The process of claim 19 wherein said melt spinning is of a plurality of said filaments to form a yarn thereof.

21. The process of claim 18 and additionally drawing the resultant filament to a draw ratio of at least about 3.

22. The process of claim 21 wherein the production rate of drawn filament or filaments, respectively, is at least about 500 m/min.

23. Articles selected from the group consisting of sewing thread, instrument strings, racquet strings, dental floss, sutures, fishing line, rope, and cords, each containing fiber of ethylene/tetrafluoroethylene copolymer having a melt flow rate of less than about 45 g/10 min as determined in accordance with ASTM D 3159, using a 5 kg load, and having a tenacity of at least about 2 g/den.

24. The articles of claim 23 wherein said tenacity is at least 3.2 g/den.

25. Yarn comprising a strand of textile material forming the core of said yarn and yarn wrapped around said core, said yarn wrapped around said core comprising fiber of highly fluorinated thermoplastic polymer.

26. The yarn of claim 25 wherein said strand comprises glass fiber and said yarn wrapped around said strand is either core spun or braided.

27. Netting of yarn comprising fiber of ethylene/tetrafluoroethylene copolymer having a melt flow rate of less than about 45 g/10 min as determined in accordance with ASTM D 3159, using a 5 kg load, and having a tenacity of at least about 2 g/den.

28. The netting of claim 27 as articles selected from the group consisting of fish netting, golf netting, soccer netting, agricultural netting, and geotextile netting.

29. Composite structure comprising fabric containing yarn comprising highly fluorinated thermoplastic polymer and binder matrix.

30. The composite structure of claim 29 as articles selected from the group consisting of printed wiring board reinforcement, radome, and antenna cover.

31. The composite structure of claim 30 wherein said binder matrix is selected from the group consisting of thermoset resin and thermoplastic resin.

32. Electrical cable comprising an electrically conductive core and a sleeve around said core, said sleeve containing yarn comprising highly fluorinated thermoplastic polymer.

33. Structure comprising fabric containing yarn comprising ethylene/tetrafluoroethylene copolymer and a frame supporting said fabric.

34. Structure of claim 33 as articles selected from the group consisting of roofing, awning, canopies tents, vehicle convertible tops, covers for boats, trailers, and automobiles, and furniture covers.

35. Luggage having its exterior comprising fabric containing yarn comprising ethylene/tetrafluoroethylene copolymer having a tenacity of at least about 2 g/den.

36. Sailcloth comprising fabric containing yarn comprising ethylene/tetrafluoroethylene copolymer having a tenacity of at least about 2 g/den.

37. Medical fabric selected from the group consisting of hernia patch, vascular graft, skin contact patch, liner for prosthetic socket, said fabric containing yarn comprising ethylene/tetrafluoroethylene copolymer having a tenacity of at least about 2 g/den.

38. Process for decontaminating fabric, comprising sterilizing said fabric, said fabric containing yarn comprising highly fluorinated thermoplastic polymer, said sterilizing comprising exposing said fabric to at least one treatment selected from the group consisting of boiling in water, steaming, optionally in an autoclave, bleaching, and contacting with a chemical sterilizing agent, said fabric not being harmed by any of said treatment.

39. Process for fire suppressing an enclosed area furnished in fabric in at least one application selected from the group consisting of wall covering, carpet, furniture covering, pillow, mattress covering, and curtain, comprising incorporating into said fabric yarn comprising highly fluorinated thermoplastic polymer effective for said fabric to pass the vertical flammability test of NFPA 701.

40. Flame self-extinguishing fabric that passes the vertical flammability test of NFPA 701, said fabric containing yarn comprising highly fluorinated thermoplastic polymer.

41. Yarn comprising ethylene/tetrafluoroethylene copolymer, said yarn having a tenacity of at least about 3.0 and tensile quality of at least about 8

42. The yarn of claim 41 wherein said copolymer has a melt flow rate of less than about 45 g/10 min.

43. The yarn of claim 41 having a tenacity of at least 3.5 g/den and tensile quality of at least 10.

44. Yarn comprising ethylene/tetrafluoroethylene copolymer, said yarn having a tenacity of at least about 3.0 and X-ray orientation angle of less than about 19°.

45. Fabric comprising yarn of highly fluorinated thermoplastic polymer and yarn of glass fiber.